THE AMERICAN JOURNAL OF

OPHTHALMOLOGY.

VOL. I. JULY 15, 1884. No. 4.

A CASE OF SYMPATHETIC NEURO-RETINITIS. REMARKS ON SYMPATHETIC OPHTHALMIA.

BY ADOLF ALT, M. D.

[Continued from No. 2, page 64].

Before giving an account of the anatomical examination of the rabbit's eyes, referred to in my last communication, I think it proper here to some extent to detail the experiments which I have made, as they are of especial interest in this question.

At first I tried to produce sympathetic ophthalmia by injuring one eye in a great variety of ways by cutting through the cornea, iris and crystalline lens, or through the sclerotic, choroid and retina, or through the ciliary region, by bruising or cutting the optic nerve, etc. All of these experiments were absolutely without results with regard to the production of any signs of sympathetic ophthalmia in the fellow-eye.

Again, encouraged by the success of Deutschmann, who, as before stated, produced a sympathetic papillo-retinitis by injecting the spores of aspergillus glaucus into rabbits' eyes, I tried to set up a yet more violent irritation of the optic nerve, than he had done, by passing through it a silk thread which had

been well soaked in croton oil. To do this appeared to be an easy matter, yet I found that it was quite a difficult procedure, and that I was successful in really getting the needle and thread to pass through the optic nerve in a very few cases only. Whenever I did succeed in doing so, the result was an undoubted optic neuritis in the second eye, which was easily recognized with the ophthalmoscope on the fourth or fifth day. In Deutschmann's cases the sympathetic papillo-retinitis usually appeared on the seventh day or a little later. As I wanted to produce a sympathetic inflammation of the uveal tract, if possible, I observed these animals for a longer time and made no anatomical examination of the eyes in this period. The optic neuritis always disappeared again in the course of about one week and no further sympathetic symptoms occurred. One of these rabbits I have now had under observation for over three months, and no further sign of inflammation has ever occurred in the eye not injured.

Thinking that after all, as Leber will have it, septic material might be necessary to produce a sympathetic ophthalmia, I next tried the injection of septic material into the eye. I allowed a piece of meat to putrefy in water, and injected a quantity of the foul juice into the left eye of a white, full grown rabbit. Therefrom resulted a mild purulent panophthalmitis which destroyed this eye, without, however, altering its shape, and not a sign of sympathetic inflammation in the fellow eye could at any time be detected. The rabbit which I used for this experiment is as yet alive and seems to be otherwise perfectly healthy. The same negative result followed injections of the same septic fluids into the eyes of some other rabbits.

Quite accidentally, while making an infusion of abrus precatorius, I one day thought of injecting some of the infusion into the eyes of a number of rabbits. I used several infusions different in strength. The uniform result was a violent purulent panophthalmitis, which led to shrinking of the injured eye. The poison mostly brought about the death of the rabbits on the third or fourth day. One rabbit remained alive for several weeks; he had a well marked optic neuritis in the uninjured eye on the third day, which, however, passed off gradually, and was no longer visible on the seventh

day. One rabbit only has now remained alive for ten weeks, and he is as yet apparently healthy. His injured eye is shrunken; he was very sick for a time and once had lost all hair of the head on the side of the injured eye, but he never developed any sign of sympathetic ophthalmia.

In one rabbit only into whose left eye I had injected a quantity of an infusion of abrus precatorius of about 3 per cent., the experiment seems to have been absolutely successful, as regards the production of an inflammation of the uveal tract in the uninjured eye (sympathetic iritis). The injured eye became greatly inflamed a few hours after the injection, and the symptoms of panophthalmitis were fully established on the second day. In the morning of the third day the uninjured eye appeared somewhat dim, and its episcleral blood-vessels were hyperæmic. At noon the iris looked swollen and had lost its lustre, the pupil was contracted, and within it a thin film of exudation was just visible. In the evening the symptoms of a plastic iritis were perfectly established, but the animal sank rapidly and died with convulsions about an hour after I had demonstrated him before the society of German Physicians of St. Louis. When at noon I had attempted an ophthalmoscopic examination, this, on account of the dimness of the media, was no longer feasible.

I dissected the eyes, optic nerves, chiasma and the adjacent parts of the brain and hardened the whole specimen in Mueller's fluid, and later on in alcohol. Of these part I gave the chiasma and most of the orbital part of the optic nerves to my friend, Dr. L. Bremer, for examination. The description of these parts being from external reasons at present not in my hands, will follow at some later date. The lack of this link is not detrimental to the end in view, since, as the reader will see, the peculiar conditions of other parts of the two eyes, examined by myself, are in themselves of very great importance for the solution of the question, by what channels the inflammatory process can travel from one eye to the other.

Macroscopical Examination.—The injured eye, when cut into two halves, showed the following conditions. The cornea and sclerotic appeared normal. The anterior chamber was filled

with a coagulated exudation which was firmly adherent to the anterior surface of the swollen iris. A similar exudation filled the posterior and vitreous chambers, and the crystalline lens was thus firmly embedded in it.

After removing the exudation from the region of the optic nerve entrance, the optic papilla, which in the normal rabbit's eye is excavated considerably, and much more so than in the human eye, was found to be swollen and even protruding into the vitreous chamber.

The macroscopical conditions of the not injured eye were about the same, but the character of the inflammation was a milder one. There was also a coagulated exudation lying upon the anterior surface of the iris and in the pupillary area, which appeared like a newly formed iritic membrane. The vitreous chamber also contained some coagulated exudation which, however, did not nearly fill this space. The optic papilla was less excavated than in the normal rabbit's eye, but its outer half only protruded slightly into the vitreous chamber.

Microscopical Examination of the Injured Eye.—The conjunctival tissue at the limbus conjunctivæ is considerably swollen and infiltrated with round cells. Its blood vessels are hyperæmic. The corneal tissue is nearly normal. The exudation which fills the anterior chamber is very peculiar in its appearance. It consists chiefly of a fine network of minute threads of fibrine, forming very small meshes, embedded in which is a moderate number of lymphoid cells. It perfectly resembles the picture as found in cases of "spongy" exudation in the anterior chamber in hemorrhagic iritis, or of a croupous membrane. Although I have examined a great many pathological rabbits' eyes, I have never before seen this form of exudation in any of them. There can, therefore, remain no doubt but that this peculiar form of exudation is here due to the foreign substance employed, namely, the infusion of abrus precatorius, which, as we know, also produces a croupous exudation upon the conjunctival surface.

The tissue of the iris is in a state of acute inflammation; it is swollen, infiltrated with round cells, and its blood-vessels are filled to the utmost with blood. Exactly the same is to be said of the ciliary body and the choroid. The exudation which fills

the posterior and vitreous chambers is virtually the same, if I may say so, *croupous* exudation which we found filling the anterior chamber.

The optic nerve, as far as I have examined it, shows throughout the signs of interstitial neuritis of a very high degree. The optic papilla is œdematous, the optic nerve and the papilla are filled with hyperæmic blood-vessels, some of which are probably newly formed.

The tissue is greatly infiltrated with round cells, especially the connective tissue tracts. In some places small hemorrhages have taken place. The sheaths of the optic nerve, especially the arachnoid, show an abnormally large amount of nuclei, and now and then, especially in transverse sections, a patch of the peculiar croupous exudation is found within the intra-vaginal space.

The orbital tissue adhering to the posterior surface of the eyeball and to the optic nerve sheaths is also hyperæmic, greatly infiltrated with round cells, and also contains nearly everywhere this croupous exudation.

Microscopical Examination of the Eye Secondarily Affected.—The exudation lying upon the anterior surface of the iris and in the pupillary area of the injured eye is of exactly the same croupous character as is the one found in the injured eye, namely, it consists of a fine network of minute fibrinous threads and contains a moderate quantity of lymphoid cells within its meshes. The tissue of the iris is in a mild state of inflammation, being filled with round-cells and swollen. Its blood-vessels are mostly empty, but their walls in many places contain round-cells in the act of emigration, or they are surrounded by round-cells that have already emigrated.

The ciliary body and the choroid, especially the latter membrane, show more decided signs of an active inflammation, and the choroidal blood-vessels are highly hyperæmic. In the supra-choroidal space near the entrance of the optic nerve the croupous exudation is again present and the contents of the vitreous chamber near the optic nerve entrance bear the same characteristics, though less marked.

The optic nerve and optic papilla show well pronounced signs of an interstitial neuritis. Their blood-vessels are hyperæmic

and the tissue of the nerve (especially the connective tissue) abounds with lymphoid cells. The sheaths of the optic nerve have an abnormal quantity of nuclei, and now and then a microscopical patch of croupous exudation is found lying in the intravaginal space.

The remaining part of the physiological excavation of the optic papilla is filled with coagulated fibrine, into which newly formed blood-vessels are seen to enter. Near these latter and farther on small clusters of round-cells are found lying. The orbital tissue also shows the croupous exudation.

The ciliary nerves of the secondarily affected eye show no pathological changes.

Epicrisis.

The question whether in cases of sympathetic ophthalmia the inflammation, as such, travels from one eye to the other, seems to me to be satisfactorily settled by the condition of the two eyes described in the foregoing lines.

The material I happened to make use of, in order to produce a severe inflammation in one eye, has brought about an exudation so peculiar in its character, that the fact of finding the same peculiar characteristic exudation in the secondarily affected eye, clearly proves that the irritating substance must have traveled from the injured eye to its fellow. (This exudation is, moreover, found in the tissue of both orbits and in the intravaginal space of both optici, although here only in small patches).

The short time (three days) in which these changes have occurred, furthermore, would, it seems, prove that reflex-action by way of the ciliary nerves could not in this case have been the factor which brought about the sympathetic inflammation.

But besides the characteristic exudation, we have found that there is also an interstitial neuritis of *both* optic nerves with swelling of the optic papilla (choked disc).

From all these facts there can be no doubt, that *in this experimental case of sympathetic ophthalmia the material which caused an inflammation in one eye, as well as the resulting inflammatory process, have both directly traveled from the injured eye to its fel-*

low, and not by the sheaths of the optic nerve alone, but also by the optic nerve itself.

With the statement of these facts, I will end this paper, and not go into any speculations. Further experiments and the microscopical examination of a number of specimens which I have already obtained will, I trust, at a future time enable me to help in the clearing up of other doubtful and important points of this interesting matter.

CLINICAL NOTES OF CASES OF FOREIGN BODIES LODGED IN OR ON THE IRIS, AND IN THE ANTERIOR CHAMBER.

BY CHARLES J. KIPP, M. D., NEWARK, N. J.

In seven of the following cases the foreign bodies were situated either in, or on the iris and had not injured the lens capsule. In six of these cases the foreign substance was iron or some other metal and in one case it was a piece of stone. In all of these cases the extraction of the foreign body was followed by complete recovery.

To these cases I have added three others, in one of which the foreign body, a piece of a gun cap, was spontaneously expelled from the eye, four years after its entrance. In the two other cases the foreign bodies, a large piece of straw and a bird shot, lodged in the anterior chamber for years without causing irritation.

CASE I.—*A Fragment of Steel in lower part of Iris. Removed with Iridectomy, eight days after Entrance. Recovery.*

T. H., æt. 31, was struck in the left eye seven years before he came under my care. He was suffering much pain in eye. There was considerable ciliary injection all around the cornea, but most marked at the lower margin. The cornea was transparent, except at wound-entrance, where it was hazy. The wound was situated close to the inner lower margin. It measured

but 3 mms in length. The anterior chamber was of normal dimensions. The aqueous was slightly turbid. The foreign body, a piece of steel and apparently not thicker than paper, 4 mms. in length and less than one mm. in width, rested on the iris about midway between lower periphery and pupillary margin. The iris tissue was somewhat swollen and discolored. On the following day the patient was put under ether and a small incision made in the cornea below the foreign body, with a narrow knife. After several unsuccessful attempts the foreign body was extracted with a fine grooved forceps. During these manipulations the iris was considerably bruised and it was therefore thought best to excise the part on which the foreign body had been situated. This operation was followed by a mild iritis with fibrinous exudation from which the patient entirely recovered in the course of ten days. An examination of the vision of the injured eye made six weeks later showed, that it was S=$\frac{5}{6}$.

CASE II.—*A Piece of Soft Solder in the Iris. Extraction Sixteen Hours after Accident. Complete Recovery.*

P. J. æt. 50, while directing some workmen in repairing machinery felt something strike his right eye. He involuntarily rubbed his eye and as it seemed all right a few minutes later thought that the substance which struck the eye had fallen out again. About two hours later, during the night, his eye became so painful that he was unable to remain in bed. He went to a physician in his neighborhood who brought him to me at 5 o'clock in the morning. I found a very small wound in the cornea near centre; the anterior chamber was of normal dimensions and in upper inner quadrant of iris, about midway between pupillary margin and periphery was seen a metallic body, about the size of a small pin's head. The eye was otherwise entirely healthy. There was much photophobia and lachrymation, but only slight ciliary injection. I advised an operation for the removal of the foreign body and performed the operation about sixteen hours after the accident. The operation was done without ether. The incision in the cornea was made at inner upper sclero-corneal margin and measured about 4 mms. After several unsuccessful attempts to seize the foreign body with forceps, I

grasped the iris on both sides of the body drew it out of the corneal wound and cut it off. The operation was followed by only very slight reaction. Eight days later the patient was out, and the sight of the eye was $\frac{2}{3}$; five years later the eye remained in the same condition. The foreign body was found to be a piece of soft solder.

CASE III.—*Fragment of Iron in Iris. Iritis on Following Day. Iridectomy on Second Day. Complete and Speedy Recovery.*

Mr. Van R., æt. 40, came to me two hours after he felt something strike his eye. At the time of the accident he was driving a nail in a hard-board, and on examining the head of the nail found that a piece of it was gone. He was not suffering any pain in eye but his sight was blurred. I found an irregular wound near centre of cornea, the anterior chamber was evacuated, and in upper outer quadrant of iris was seen a piece of glistening metal about 3 mms. in length and about one half of a mm. in width, it was apparently embedded in the iris tissue. There was but little irritation. Sight was not examined. I applied a pressure bandage, and urged the man to let me remove the foreign body in the afternoon of same day, but he declined to have an operation made. In the afternoon of the following day I was called to his house as he was suffering much pain in eye. I found the cornea hazy especially in the vicinity of the wound, the anterior chamber was restored, the aqueous was very turbid, and the iris swollen and discolored. The foreign body was no longer visible, but in its stead, a whitish granular exudation was seen at the place occupied by the foreign body on the day before. I at once put the patient under ether and made a large iridectomy upward and outward. I placed a branch of the forceps on each side of, and a little below, the whitish exudation and thus withdrew the foreign body with the iris. On the following day the cornea was much clearer, the aqueous was transparent and the iris was of normal color. A week later, the eye was white and all symptoms of the kerato-iritis had disappeared. S was slightly impaired by the central scar in the cornea. Three

years later the sight was as good as before the accident. The foreign body was found to be a piece of iron.

CASE IV.—*A Piece of Iron on Iris. Extraction of Foreign Body five weeks after Accident. Recovery.*

J. G., æt. 21. Five weeks before I saw him for the first time, he felt something strike his eye while he was hammering. Until very recently he was free from pain. On examination I found considerable ciliary injection around the entire cornea. Cornea was clear except in lower part where there was a linear scar about 3 mms. in length. The anterior chamber was of normal dimensions. The aqueous clear. Iris of normal color and texture. The foreign body, a piece of iron about 4 mms. in length and one mm. in width was lying free on the iris about 1 mm. from inner margin just below the horizontal meridian. The pupil was free and active. An operation was advised but declined. Eleven days later the patient returned. With exception of increased ciliary neuralgia the condition was as above stated. On the same day I made an incision with a lance-shaped knife, about 4mms. in length, almost over the foreign body; grasped this with forceps and extracted it. There was no prolapse of iris and pupil remained perfectly round. The wound healed by first intention. No iritis developed. Sight was as good as before the accident.

CASE V.—*A Piece of Iron on Iris. Extraction without Iridectomy. Recovery.*

W. H., æt. 45. Foreign body entered eye two days before I saw him. I found a linear wound with yellowish lips between the outer margin and centre of cornea. Cornea around wound hazy. Anterior chamber of normal dimensions. Iris discolored but not much swollen. Pupil small. The foreign body was found on the iris near outer periphery. It was a thin piece of iron about 3 mms. in length and 1 mm. in width. On placing an electro-magnet on cornea over foreign body, this came forward and with it the iris. I made an incision about 3 mms. in length, with a lance-shaped knife, a little below the foreign body, and although the knife was quickly withdrawn all the aqueous escaped. Several attempts to draw out the foreign body with the

magnet having failed, I removed it with the forceps. The iris did not prolapse. Eserine was instilled. Ten minutes later the pupil was found to be very small and round. The operation was followed by no reaction and the wound of entrance healed speedily, leaving only an insignificant scar. A week later sight was as good as in the other eye, and the pupil free.

CASE VI.—*A Fragment of Iron on Iris. Extraction with Magnet. Recovery.*

J. P. S., æt. 35. Was struck in right eye by a piece of iron half an hour before I saw him. The eye showed slight ciliary injection. In cornea near outer margin was a small linear wound, otherwise it was clear. The anterior chamber was of normal dimensions and the aqueous was transparent. The iris was of normal texture, close to inner periphery a little above the horizontal meridian, a piece of metal about 5 mms. in length and less than a mm. in width, was seen to stick with one end in the iris while the other was projecting full in the anterior chamber. Two hours later the foreign body was found lying flat on the iris in the same position. On applying the electro magnet to the cornea over the foreign body, this flew up against the cornea, and was then moved by the magnet to the lower half of the iris about midway between the periphery and the pupillary margin. Here I made a small oblique incision in the cornea, and withdrew the knife so quickly that but a small quantity of the aqueous escaped. I then introduced the point of the magnet into the wound, and on withdrawing it found the foreign body hanging to it. Eserine was instilled immediately afterward, and a bandage applied. A few hours later the pupil was found small and round. The wound healed by the first intention. No iritis followed. A week later the patient was discharged from the hospital, and now six months later his sight in this eye is perfect.

CASE VII.—*Burn of Cornea. A Fragment of Stone on Iris. Extraction on Second Day. Recovery.*

R. B. æt. 23, had his face and left eye burned by the premature explosion of a mixture of powder and sand two days before

he came to me. I found chemosis and intense injection of the ocular conjunctiva. The whole cornea was hazy and rough especially in central part. A little above centre of cornea was an irregular wound. The anterior chamber was rather shallow ; the aqueous was muddy, and a moderate hypopyon occupied lower part of anterior chamber. The iris was swollen and resting on it in upper outer quadrant, about a mm. from pupillary margin was seen a foreign body of about the size of a large pin's head. As far as could be ascertained the lens was not wounded. On the same day I made a small iridectomy upwards, withdrawing the foreign body with the iris. Under the protective bandage and atropine the eye speedily recovered. Two weeks later the patient was discharged without impairment of vision.

An analysis of the above cases shows that symptoms of iritis showed themselves very soon after the lodgment of the foreign body in four of the cases ; in one of these swelling of the iris is noted as present three hours after the accident. In the remaining three cases only hyperæmia of the iris existed at the time the patient came under observation ; one on the second day, one on the third, and one in the fifth week after the entrance of the foreign substance in the eye.

Why in one case a foreign body should cause the development of an iritis very speedily after its lodgment, while in another the prolonged contact of the metallic body with the iris failed to produce even a morbid hyperæmia, it is difficult to understand. As the foreign bodies in the above cases were all nearly of the same size, and consisted of iron or sand, the mechanical and chemical effects produced by them in the iris can not have differed sufficiently to account for the different degrees of reaction witnessed in these cases.

The experiments made by Leber[1] on rabbits have shown that sharp pointed, aseptic fragments of steel carefully introduced into the anterior chamber do not produce inflammation of the iris, and the inference seems, therefore, very natural that if an inflammation follows the lodgment

---

1 Græfes' Archiv. f. Ophthalmologie) Bd. xxx, Abtheil. 1. p. 246.

of a piece of iron in the iris that the foreign body has taken with it septic matter into the eye. No one has, however, as yet, proved that such is actually the case. On the other hand Leber's[1] examination of foreign bodies immediately after their extraction from the eye and of eyes containing foreign bodies immediately after exuc'eation, have thus far failed to discover micrococci or other parasitic elements within the foreign bodies or in the tissues, and the inflammatory product in which these were situated.

With regard to the treatment employed in the above cases, I have but few words to add. Believing that in every case in which the eye shows signs of irritation, nothing short of the removal of the foreign body will avert further damage to the eye, I have never lost time in trying to subdue the irritation by other means. In several cases I operated while the iris was intensely inflamed, and in all but one of these the iritis subsided speedily. In the case in which it did not, the iris was much bruised, in consequence of insufficient size of corneal wound. Wherever practicable, I have extracted the foreign body without an iridectomy, except in cases with marked iritis. In these the iridectomy seems to exert a favorable influence. For the removal of the foreign body I have used mostly a pair of very delicate grooved forceps in cases where the foreign body was entangled in the iris, and Knapp's foreign body hook, or an ordinary blunt hook, when the body was lying on the membrane. Very little difficulty will attend the removal, provided the incision in the cornea is sufficiently large. I have usually made the incision with a narrow knife, sometimes with a Beer's cataract knife, which seems best adapted for cases requiring a large opening. Pieces of iron and steel can doubtless be extracted with the magnet in many cases, especially if there is an anterior chamber.

A small and oblique incision in the cornea and the quick withdrawal of the knife, so as to prevent as much as possible the escape of the aqueous, seems desirable if the foreign body is so situated that the incision can not be made close to it. With a powerful magnet (I prefer Bradford's electro-magnet) the foreign body may be drawn from a considerable distance, provided some

---

1 Op. cit. p. 249.

aqueous remains, and it is therefore only necessary to select a point of sufficient size to fill the opening in the cornea and to push it only a short distance in the anterior chamber to make sure of getting the iron into the wound where it can be removed with forceps. Should iris prolapse, it may be cut off or returned into the anterior chamber, if this can be done without much bruising. Eserine should be applied at once if no iritis is present.

CASE VIII.—*A Large Piece of Stone in Anterior Chamber for two Years without Producing Disturbance.*

The patient, an Italian laborer, æt. 45, came to the Newark Charitable Eye and Ear Infirmary, for treatment of a scald of his right eye. On examination the cornea was found to be very hazy in lower half, and the epithelium of this part destroyed. The lower third of the anterior chamber was filled with a mass, the exact nature of which could not be made out. It looked, however, like a fibrinous exudation around a thin piece of metal, the sharp edge of which was apparently projecting slightly through the upper surface of the exudation. The upper part of the iris was normal. The pupil was free and active. No injury of lens or deeper parts. As I was unable to discover a wound in the cornea, and the patient was not able to converse in a language with which I am familiar, I deferred the making of a diagnosis until an interpreter could be obtained. It was then learned that the eye was wounded two years before in an explosion in a mine. That he was treated for months in a hospital in Canada and discharged after the inflammation had passed off. The mass in his eye he noticed shortly after his departure from the hospital, but as it did not give him any inconvenience had not considered it worth while to consult a surgeon with regard to it. On close examination I now found a long linear scar at the lower outer sclero-corneal junction.

After his recovery from the scald I removed the foreign body in the following manner: Hoping to be able to pass a narrow knife behind what I still thought to be an exudation around a foreign body, I entered the knife at outer margin of cornea, 2 mms. below horizontal meridian, with the intention of making the counter-puncture at inner margin, but had advanced only

a short distance when the point of the knife came in contact with the mass, which felt as hard as stone. Finding it impossible to advance the knife any farther in the direction I had intended to take, I withdrew it partially, then directed the point downward and made a small incision in outer lower margin. I next enlarged the incision with a strong pair of strabismus scissors to about one fourth of the circumference of the cornea. I then grasped the end of the mass nearest the outer margin with anatomical forceps, and withdrew it lengthwise without the slightest difficulty. A tag of iris prolapsed and was abscised as it was found impracticable to reduce it. The wound healed in the course of a week, and the eye has since then given him no trouble. The foreign body was found to be a piece of granite.

CASE IX.—*A Bird Shot in Lower Part of Anterior Chamber for Eight Years, without Causing Irritation.*

C. H., æt. 13, I saw for the first time eight years ago. Three days before her visit to me she had been shot in the left eye. Several pieces of shot were lodged in the lids and one in the ocular conjunctiva. At upper sclero-corneal junction was a prolapse of iris, about the size of a lentil. The cornea was clear. The anterior chamber filled with blood. I removed the pieces of shot in the lid, and in the conjunctiva, and abscised the prolapsed iris. Under cold applications and atropia, the blood was absorbed in a short time. It was now seen that the lens had been injured, as cataract was developing, and in lower part of anterior chamber was found a round body similar to the shot previously removed. Nothing further was done. Since then I have seen the patient from time to time. The eye now diverges. There is a membranous cataract to which the pupil is adherent and the shot remains in the same position. At no time has this eye shown signs of irritation since the injury, and I have, therefore, not felt called upon to interfere. The eye has good perception of light, but the visual field is deficient downward, and I shall have no hesitation in removing the eye if symptoms of inflammation develop.

CASE X.—*Spontaneous Expulsion Through the Cornea of a Large Piece of a Gun-cap Four Years After its Entrance into the Eye.*

F. J. U., æt. 24, states that four years ago a piece of a gun-cap struck his right eye. Considerable inflammation followed. Since then he has been blind in the eye. Until recently the eye has given him no further trouble. Now he has pain. There is considerable ciliary injection, especially in upper part. In lower part of cornea is a triangular scar, and at upper sclero-corneal junction is situated a yellow pustule about the size of a split pea. The cornea adjoining is hazy, but otherwise it is clear. Connected with the yellow pustule mentioned is a mass of pus, which hangs in upper part of anterior chamber. The iris is discolored. The pupil excluded. Cataracta acreta. Perception of light fair. Visual field intact. I ordered warm fomentations and instillation of atropia. Two days later all pain had left the eye, and the mass of pus in upper part of anterior chamber had fallen to the bottom. Otherwise there was no change. Patient was told to come again in a few days, but remained away for seven months. He now felt something sharp scratching the upper part of the eye and wished me to remove it I at once saw that the pustule had broken and a sharp point protruded from it. Examination showed the foreign body to be metallic. Careful traction failed to dislodge it, and I therefore placed the patient under ether, enlarged the opening with scissors, and withdrew the foreign body, without difficulty. No aqueous or vitreous escaped. The wound healed kindly in the course of a week. Subsequent examinations have left it undecided as to where the foreign body was situated. The iris is adherent to cornea a mm. below upper corneal margin, and it is therefore very probable that it lodged partly in iris and partly in lens. The foreign body was a thin piece of copper, 4x3 mms.

It seems most probable that in this case the foreign body was incapsulated for about four years, then a rupture of the capsule occurred from some cause or other and a new localized suppuration set up by the fragment of copper in its vicinity, which led to perforation of the cornea.

Instances of the spontaneous expulsion of foreign bodies from the eye must be very rare, as I have been able to find but one case on record. This is reported by Dixon, in *Dublin Quarterly Journal*, 1848, p. 210. I have been unable to read the case in the original, but from the excerpt given by Cooper in his book "On Wounds and Injuries of the Eye, London, 1859," it appears that in Dixon's case a piece of gun-cap was expelled eight years after its entrance.

[The Editor of this journal reported a similar case in the Archives of Ophthalmology and Otology, Vol. VI. No. 1 and 2, p. 207.]

CLINICAL OBSERVATIONS.

BY L. WEBSTER FOX, M. D.,
Ophthalmic and Aural Surgeon to the Germantown Hospital, Philadelphia.

CASE I. *Acute uni-ocular neuritis.* On February 15, 1883, Wm. Pinkerton, æt. 20, presented himself at the eye clinic with the following history. For the last two weeks noticed a dimness of vision in the left eye. The haziness has increased markedly the last week, and has had headaches; the last two days severe pain in the head which, however, cannot be localized, no nausea; no pain in the eye-ball, neither is the eye sensitive to light. Pupils respond to light and accommodation.

Vision R. E. $=\frac{20}{20}$. J. No. 1 at 8″

" " $=\frac{20}{200}$ (?). J. (?). No. 19 at 8″

Refuses glasses. With ophthalmoscope the media of the right eye, clear and no lesion in fundus, arteries and veins of normal calibre, retina reflecting the "watered silk" appearance. Hypermetropia 0.50. D. A well defined halo surrounding the macula, optic nerve slightly pinkish with its sheath sharply defined. In the left eye, the media were clear, but optic disc decidedly swollen (+3.50), marked œdema of retina surrounding

it, veins enlarged and tortuous, arteries much lessened in calibre. Both arteries and veins minus their reflex, vitreous slightly turbid in the region of papilla. The fields of vision and color were contracted 10° with marked diminution of acuity in the center but no scotoma.

No history of syphilis, nor abuse, could be elicited. He was otherwise healthy and well developed, and led a temperate life. Family history irrelevant.

The following treatment was ordered: Inunctions of hydrarg. one dram to be rubbed on the tender parts of his shin twice daily. Internally, Hydrarg. bichlor. gr. $\frac{1}{48}$; Potass. iod. grs. x; aq. dest. ℥j, three times daily. Prescriptions given for ung. hydrarg. ℥j and mixture ℥iij.

The patient did not return to the clinic for eight months. Then, by request, he informed me that the ointment was applied and medicine taken as directed. On the third day after commencing the use of the drugs, there was a decided metallic taste in his mouth and vision began to improve. At the end of three weeks, the patient said there was no apparent difference in the visual acuity of either eye. Owing to this improvement, patient did not think it necessary to return to the hospital. He took the medicine, applied the ointment but did not have the prescription re-filled. There was no salivation. In response to a request, the patient presented himself at the clinic December 20, eight months after the first visit, when the following entry was made in our case-book. Right eye normal in every respect. Left eye vision $\frac{20}{20}$, J. No. 1 at 8″, sph. +0.25 D sharpens distant vision—pupil active and media clear, arteries and veins normal in calibre and edges sharply defined even to their entrance into the optic nerve, which has a pale color, sharpening the outline of its sheath. No other change noticed.

The "watered silk" reflex from the retina (?) and the halo around the macula present but not as pronounced as in right eye. Field of vision normal and color-perception good.

May 10, 1883. Patient writes, eyes are normal in every respect—and has had no headaches since week prior to his visit to the hospital.

The interest in this case lies in in its rapid recovery under the

influence of a very small quantity of mercury. The arrest of exudation in and about the optic nerve, preventing nerve fibre change; restoration of the function of the eye; the complete absorption of the exudative material, deposited in and around the papilla; the "watered silk" reflex of the retina returning and the bloodvessels recovering their normal calibre. The patient being of a robust nature, aided by the stimulating and alterative powers of the hydrarg. developed resisting force to repel the pathological products, which otherwise might have endangered the vision of his left eye.

CASE II. *Quinia Amblyopia cured by the internal Administration of Hydrobromic Acid.*

H. S., æt. 13 years, was brought to me on account of a sudden loss of vision in both eyes. The lad had had an attack of malarial fever which had assumed a chronic form. Quinia Sulph. had been administered in large and continued doses, producing cinchonism twice during an interval of three months. It was during this last condition that amblyopia occurred. Vision at this time equaled $\frac{20}{200}$. No limitation of visual fields, neither was there color blindness. There was no marked lesion in fundus oculi, other than a slight hyperæmia of the retinæ.

The patient was now apparently free from the malarial poisoning although his general condition was much below par. Acid hydrobromic(Squibbs), fifteen drops administered three times daily. There was a change in his vision for the better, observed after the third day. His sight continued to improve, at the end of two weeks $\frac{20}{20}$ obtained for distance while J. No. 2 at 10″ read quite easily. The dose of the acid was decreased to five drops thrice daily, which was continued for a fortnight. Quinia sulph. was not taken during this treatment. The patient regained his strength and has up to the present been free from the malarial trouble and vision remained normal. We have found in many cases where quinia has produced tinnitus aurium the administration of hydrobomic acid will prevent this unpleasant symptom becoming manifest.

CASE III. *Sarcoma of Choroid. Enucleation of Eye-ball.*

J. M., æt. 69 years. About two years ago first noticed a fail-

ing of vision on the nasal side of the left eye; this gradually grew worse, till at present he has peripheral vision only, a speck of light on the temporal side. His father was blind in one eye "something grew out of the sight," A sister (older than the patient) became blind in one eye, died shortly afterward; a niece had a daughter who died from a tumor of the brain; other than this his family had no hereditary taint.

Right eye was normal.

Left eye vision almost *nil*, conjunctiva congested, abnormal vessels, well marked on the upper and temporal side of eye-ball.

Tension —, with pupil dilated ad maximum by oblique illumination a yellowish reflex could be obtained showing close proximity to the posterior part of the lens of a growth in the vitreous. This body extended beyond the posterior pole of the lens. Several dilated blood vessels couldreadily be traced. By direct illumination the growth assumed a greyish color. The eye-ball was enucleated. When it was carefully cut through its equator with a razor, a large rounded growth was found springing from the choroid, on the temporal side of the globe, extending forward to the ciliary bodies, backwards to the optic nerve and almost completely filling the interior of the eye-ball. The retina had been changed; that part covering the tumor thickened, while the part on the nasal side was in place and seemingly normal. The retinal vessels had assumed the condition of the retina.

A microscopical examination of the tumor proved it be a small round cell sarcoma, melanotic in character. No disturbance of the optic nerve.

RETINOSCOPY.

BY A. R. BAKER, M. D., CLEVELAND, OHIO.

Dr. Cuignet in 1874 was the first to publish a systematic article on this subject, under the unfortunate title of Keratoscopy. Dr. Parent suggested the name of Retinoscopy, as the appearance presently to be described is due to the play of light and

shade on the retina. To Dr. Forbes in the Opthal. Hos. Rep., Vol. X., pp. 62, is due the credit of first calling attention to this subject in England.

Retinoscopy is now practiced in the London hospitals by placing a good light, such as is used in an ophthalmoscopic examination, above the head of the patient in the dark room; the observer sitting directly opposite at the distance of about four feet. A slightly concave mirror one and a half inches in diameter with a central perforation is used. Direct the patient to look past your left ear to the wall beyond, if the left eye is to be examined, and vice versa if the right, which usually relaxes the accommodation. With a little experience you can tell by the contracting and dilating of the pupils, under the influence of light, whether the eye is accommodating or not.

By looking through the perforation, throwing reflected light into the eye, and slowly rotating the mirror, if the eye is emmetropic there will be seen a decided shadow moving opposite to the direction the mirror is rotated in, moving equally in every direction.

Beginners usually make the mistake of moving either their heads or the mirror in various directions instead of rotating the latter. It is also necessary to have your own error of refraction, if any be present, corrected by suitable spectacles or you will add yours to that of your patient. Care must be taken to have the patient's head held perfectly straight and the spectacle frames carefully adjusted so that they centre correctly.

Now if a + 1. D is placed in the frame in front of the eye and the mirror rotated as before, and no shadow can be seen in any meridian, we can say confidently, the eye is emmetropic. If there is a shadow moving opposite, alike in every direction, we have a case of simple hypermetropia. If we have a shadow moving opposite in one meridian and none in the other we have a case of simple hypermetropic astigmatism. If we have a shadow moving opposite in both meridians, but faster in one than the other, we have a case of compound hypermetropic astigmatism. If the shadow moves with the mirror equally in every meridian, we have a case of myopia. If the shadow moves with the mirror in one meridian and the + 1. D neutralizes it in

the other, we have a case of myopic astigmatism. If the shadow moves with the mirror in one meridian, and opposite in the other, we have a case of mixed astigmatism.

The amount of error of refraction is easily determined by placing spherical lenses in front of the eye until the shadow is neutralized.

If it requires a + 4. D. s. to neutralize the shadow in every meridan of a given case, we have 3. D. of hypermetropia. If it should require a + 1. D. to neutralize the shadow in the vertical meridian and a + 3 D. in the horizontal, we would require a + 2 D. c. axis 180 to correct the astigmatism. Or in another case it may require a + 2. D. to neuralize the shadow in the horizontal and a + 5. D. in the vertical meridian; this case would be corrected by the following + 1. D. s. ⌒ + 3. D. c. axis 90. Cases of myopia are worked out in the same manner. If a given case requires a + 1. D. in the vertical a — 3. D. in the horizontal meridian, it is corrected by —4. D. c. axis 180. Or another requires a— 2. D. vertical and a — 3. D. horizontal and is corrected by — 4. D. s. ⌒ — 1. D. c. axis 180. I not infrequently meet with cases like the following and I am quite certain many cases of irregular astigmatism which I was unable to correct satisfactorily either to myself or to the patient were belonging to this class: Vertical meridian requires a+ 3. D. horizontal a — 4. D. and is easily corrected by a + 2. D. s. ⌒ — 5. D. c.

The literature of this subject is yet very incomplete, and from this imperfect description retinoscopy may appear somewhat difficult to one who has not attempted it. Practically it is very simple, just as easily done as neutralizing a concave with a convex lens. The principle is in fact about the same. Any one may become an expert with a little practice.

It is to be remembered that the same principles should govern us in prescribing the spectacles to be used as after determining the refraction by any other method. I presume that we have all learned sometimes by a not very pleasant experience that the lenses which correct the refraction theoretically, often practically are worse than useless. The peculiarities, temperament, previous habits, general condition, age, occupation, and a number of other questions must all be decided before ordering the spectacles.

One among the many advantages of retinoscopy, is that we need not depend upon the statements of the patient; with children and ignorant persons who do not know their letters, it is almost indispensable. We are often able to fit spectacles to children with commencing strabismus and avoid the necessity of an operation. In cases of astigmatism, patients who have never seen things in their right proportions and whose statements always have to be taken with a grain of allowance, it saves a large amount of annoyance. The saving of valuable time is an important consideration. Cases which I formerly kept under the influence of atropia for weeks and found it necessary to give five or six sittings of long duration which tried the patience of both myself and patient, I am now usually able to dispose of at one sitting of short duration much more satisfactorily.

It does away with the use of atropia in a large percentage of cases. In cases of spasm of the accommodation it is, however, necessary to paralyze the ciliary muscle and in many other cases it is much easier to have the unknown quantity of accommodation out of the way, yet I do not find it necessary to use atropia once, where I formerly used it ten times.

THE VALUE OF PUPILLARY SYMPTOMS IN GENERAL DISEASE.—AN ANALYSIS OF ONE THOUSAND CASES.

Abstract of an Address on Ophthalmology read before the Pennsylvania State Medical Society, 1884.

BY W. S. LITTLE, M. D., PHILADELPHIA, PA.

Hospitals for the chronic forms of disease were the first to open their doors to the ophthalmic surgeon, who had been restricted to special hospitals; the result of observations made in these institutions, in working out the eye symptoms, associated with many chronic diseases, soon had their influence in placing an ophthalmic surgeon in hospitals for acute disease. The past twenty years have seen this development of ophthalmic medicine

in this country at least. The eye and ear hospitals of the present time in several of our large cities have a throat, skin and nervous department attached.

Diseases affecting the *nervous* system have received the greatest benefit from the development of ophthalmic medicine. The leading contributions to ophthalmic medicine have been from Germany and England.

Medical education shows the advancement of it, and post-graduate schools have resulted from the success of practical courses given in ophthalmic hospitals.

Medical ophthalmoscopy has been the leading factor in developing ophthalmic medicine. The cases of acute diseases described by Allbutt in his work: The Ophthalmoscope, afford a pathological ophthalmoscopic picture in 89 per cent. of the cases; in insanity in 81 per cent. Noyes found lesions in the fundus of the eye in 73 per cent. of the cases examined by him at the Utica Insane Asylum, N. Y.

Among Gowers' cases reported in his work: Medical Ophthalmoscopy, it appears in all the cases. In my study of the cases at the Feeble Minded Institution for Children, at Elevyn, Pa., the ophthalmoscope afforded me a picture of diseased condition of the nerve and retina in 13 per cent. of the cases, the age of the patients (youth) and class of diseases rendering the percentage necessarily low.

The study of the visual field for light and color perception yields results of value in diagnosing lesions in the brain. The ocular symptoms of ophthalmoplegia externa and interna have been made more recently an available source of information in studying nervous disorders. The abnormal conditions of the pupil are classified under ophthalmoplegia interna.

The reflex centre for light shows certain variations in some nervous diseases. The study of Allbutt's and Gowers' cases affords me ophthalmoplegia externa present in 14 per cent. of their cases of acute diseases, principally of the nervous system.

Among the cases observed by me at Elevyn and at the Norristown Insane Asylum, Pa., only four cases were seen among six hundred and fifty-eight. Strabismus, non-paralytic, occurred at Elevyn in 15 per cent. of the cases; myopia was prevalent, with

convergent strabismus, and hypermetropia had an existence more than usual in divergent strabismus; whether this may be the result of nervous influences, rather than ocular condition in such cases, we will not now discuss.

Nystagmus was observed in only four cases of the thousand analyzed. The eye-lids were affected in three cases among the thousand studied.

Cycloplegia and iridoplegia combined,are found in spinal disease in 15 per cent. of the cases (Gowers'); in other diseased conditions of the nervous system not so frequently, also in ophthalmic work, seen after diphtheria and fevers. In general paralysis of the insane, W. Bevan Lewis states: that while 15 per cent. of the cases had an immobile pupil, 28 per cent. incompletely so; yet 28 per cent. read Jaeger No. 1 without plus glasses, showing that the muscle of accommodation was not impaired in many cases, while the iris was.

A study of Allbutt's and Gowers' cases, as reported in their works, gave me an impaired action of the pupil in 23 per cent. of their cases. Albutt's and Noyes' cases of insanity, in 5 per cent.

Having obtained their statistics, I undertook the examination of patients at the Feeble Minded Institution for Children at Elevyn, Pa., under the care of Dr. I. N. Kerlin, and at the State Hospital for the Insane, S. E. District, of Pennsylvania, at Norristown, Pa.; Dr. R. H. Chase in charge of the male cases, Dr. Alice Bennett in charge of the female cases. The condition of the pupils was observed in each case without knowledge of the diagnosis made by the physician in charge; after completion of my work, the diagnosis in each case was given and the percentage for the presence of pupillary condition for each disease was made out.

The reputation of the physicians in charge of these institutions, in diagnosing the diseases under their care, render my statistics more valuable; for the facilities granted me I am greatly indebted, and my thanks are due. The cases of Allbutt, Noyes and Gowers were analyzed in the same way.

A thousand cases of different forms of disease, principally of the nervous system, have been collected, and the percentage for the presence of pupillary symptoms for each of the diseases un-

der consideration obtained. I have considered the subject of sufficient importance to bring to your notice at this time. The ocular condition is one readily observed and under certain conditions a valuable symptom in studying disease, having a prognostic value in 67 per cent. of Allbutt's and Gowers' cases, being associated with fatal symptoms.

The statistics of observers as to pupillary symptoms in insanity have varied greatly; this is no doubt due to the non-recognition of intraocular conditions, principally optical defects; Lesser speaks of this; the exclusion of these defects, I believed, would give a more exact and uniform result for extraocular causes. Among the three hundred and fifty cases at Elevyn (youth) I have made this differentiation. At Norristown, insane cases, I have presented only the manifest pupillary states from all causes, extraocular and intraocular, no differentiation being made. Allbutt and Gowers make no statements as to optical defects in their cases. In the address I have given a review of the ancient and modern theories of pupillary movements, founded on the anatomical knowledge existing at the time; the advancement of ophthalmology and ophthalmic medicine is thus exhibited. The anatomy and physiology of the nerves and influences affecting the normal movements of the pupil are stated; the abnormal movements of the pupil are there considered. Methods of studying the pupil are given.

The varieties of pupillary states as produced by disease, given by various authorities are as follows:

Reflex iridoplegia.
Absolute or total iridoplegia.
An immobile pupil.
Myosis.
Inequality of the two pupils.
A variable pupil, a state of spasm.
Hippus.

A classification adopted in my cases and in the statistics, is as follows:

A maximum pupil, bilateral.
An unequal state of the two pupils.
A minimum pupil, bilateral.

An immobile pupil.

A variable pupil, a state of spasm.

Hippus.

Allbutt's, Noyes' and Gowers' Cases.—342 Cases of acute disease and insanity.

Number of acute diseases 18.

Pupil affected in 23 per cent. of the cases. In insanity pupil affected in 5 per cent. of the cases.

Other affections of the eye with pupillary symptoms among 184 cases of acute disease:

Pupil.	Nerve.	Muscle.	Lid.	Affected in	3	cases.
"	"	"		"	8	"
"	"			"	34	"
"				"	5	"

Ophthalmoplegia externa:

Allbutt's cases in 11 per cent.

Gowers' cases in 21 per cent.

Fatal cases with pupillary symptoms:

Allbutt's cases in 68 per cent.

Gowers' cases in 40 per cent.

Diseases in which pupillary symptoms were present, with percentage:

Allbutt's and Gowers' Cases.

Abscess of brain	100	per cent.
Fracture base of skull	100	"
Locomotor ataxia	100	"
Aneurism ant. cerebral artery	100	"
Neuralgia cervical sympathetic	100	"
Fracture of skull	75	"
Facial paralysis	75	"
Lateral Sclerosis	50	"
Mercurial Poisoning	33	"
Sclerosis of brain	33	"
Tumor of brain	32	"
Meningitis	31	"
Concussion of brain	25	"
Spinal Disease	22	"
Lead poisoning	20	"

Hemorrhage in brain	20 per cent.
Epilepsy	13 "
Bright's disease	7 "

Allbutt's and Noyes' cases in Insanity.

Mania	2.5 per cent.
General paralysis of the insane	7.8 "
Monomania and melancholia	5.8 "

Varieties of pupillary states:

Maximum	17.8 per cent.
Minimum	3.8 "
Unequal	——
Spasm	1 "
Immobile	.5 "
Iridoplegia	.5 "

The Institution for Feeble Minded Children at Elwyn, Pa., under the care of Dr. I. N. Kerlin.

367 Cases observed, 17 excluded for disease of the eye.

350 Tested for pupillary condition.

136 Cases affected, or 38.7 per cent.

Intraocular causes omitted as follows:

Squints in	15 percent.
Optical defects in	4.5 per cent.
Disease of retina or nerve in	1.4 per cent.
Nystagmus	.5 per cent.

Extraocular causes affecting pupil:

61 cases, or 17.3 per cent.

Males 17.4 per cent.

Females 17.3 per cent.

Optical defects in 50 per cent. of all the cases. Myopia 16 per cent. Hypermetropia 32 per cent.

Varieties of diseases with pupils affected and percentage.

Imbecility	High grade	8.8 per cent.
	Middle grade	14 per cent.
	Low grade	12 per cent.
Idio-imbecility		28 per cent.
Idiocy		41 per cent.
Juvenile insanity		20 per cent.
Epilepsy		37 per cent.

Varieties of pupillary conditions:

Maximum	....	6.2 per cent.
Minimum	....	4.3 per cent.
Unequal	....	6.5 per cent.
Hippus	....	.2 per cent.

Watery silk appearance in eye-ground seen in 9 cases, only 4 of which remained permanent after correcting optical defect by the ophthalmoscope.

Insane Hospital, Norristown, Pa., Dr. R. H. Chase, in charge of male cases; Dr. Alice Bennett in charge of female cases.

308 Cases examined; 39.6 per cent, with pupils affected:

Males 43 per cent.

Females 35 per cent.

These statistics represent manifest pupillary conditions from all causes, except opacity of the media of the eye.

Varieties of Diseases with pupils affected and percentage:

	Males.	Females.	Total.
Monomania,	20 per cent.	—— per cent.	16 per cent.
Melancholia acute,	46 "	33 "	41 "
" chronic,	28 "	11 "	25 "
General paresis,	100 "	100 "	100 "
Dementia chronic,	41 "	37 "	39 "
Mania acute,	57 "	57 "	57 "
" chronic,	54 "	18 "	35 "
" recurrent,	—— "	50 "	50 "
Imbecility,	—— "	25 "	25 "
Epilepsy,	—— "	66 "	66 "

Two cases of ophthalmoplegia externa in general paralysis of the insane.

Varieties of pupillary condition:

	Male.	Female.	Total.
Maximum,	11 per cent.	12 per cent.	11 per cent.
Minimum,	14 "	16 "	12 "
Unequal,	16 "	15.5 "	14.6 "
Immobile,	1.3 "	.6 "	1 "

Allbutt's, Noyes' and Gowers' cases, with my own at Elevyn and Norristown.

Males, 602, pupils affected in.....22.5 per cent.
Females, 398, " " .....24.8 "
Total, 1,000 " " .....23.5 "

Varieties of pupillary condition:

Maximum,	9	per cent.
Minimum,	7	"
Unequal,	6.8	"
Immobile,	0.4	"
Spasm,	0.2	"
Hippus,	0.1	"

OBSERVERS.

Allbutt,	245 cases; pupils affected in	14	per cent.
Noyes,	37 cases; " "	5.4	"
Gower,	60 cases; " "	25	"
W. L. Little	At Elevyn, 350 cases; " "	17.4	"
	At Norristown, 308 cases; " "	39.6	"

Acute diseases in.....23.3 per cent,
Insanity, all grades, youth and old age....23.5 "

A CASE OF SYPHILITIC PERIOSTITIS (GUMMA?) OF THE ORBIT.

BY W. HUNICKE, M. D., ST. LOUIS.

M. R., æt. 29 years, married, mother of two children (one still born, the other a sickly child, gives the following history:

For the last two years patient has been suffering continually with intense headache, especially in the back part of the head.[1] Pain exacerbating towards morning. There had been also a lancinating pain, which increased upon pressure, in the region of the right infra-orbital nerve. About eight months

1. I questioned patient whether she had ever been diseased. She denies it, but admits of having had an eruption all over her body about two and a half years ago. She was then an inmate of a house of ill fame, as I was told by some relatives of hers.

ago patient noticed that the right side of her face was changnig —to use her own words, that the "wrinkles had disappeared." During that time patient was unable to close her right eye, and it seemed to her that the upper lid only dropped down slightly when the attempt was made to close the eye. There was ectropion of the lower lid. Patient found difficulty in closing her mouth, pronouncing labials, masticating her food and retaining her saliva. This facial paralysis came on gradually and disappeared again after two months' duration, leaving no traces. She had scarcely recovered from the facial paralysis, when she noticed a swelling on the centre of her forehead. The swelling grew slowly until it acquired the size of an ordinary hazelnut. It was round, hard (?) somewhat red and accompanied by severe remitting pain. The tumor, maintaining its size for a few weeks, diminished gradually, and with the diminution the pain began to moderate. During all this time patient experienced a most intense remitting pain in the right orbit. Pains were so severe that she was unable to rest and opiates gave her no relief. As the tumor on the forehead diminished, the pain in the orbit increased and the patient began to see double images, when she looked into a certain direction.

Upon examination, I found that there existed a circumscribed roughness about the size of a dime on the os frontis, occupying the place where the tumor had been. The right eye was protruding from the orbit. The direction of the optic axis when patient was asked to fix an object directly in front of her, was downward and outward, thus causing a divergent squint. Diplopia was heteronymous, in fact binocular fixation occurred only when patient was directed to look downward and toward the right. The eye seemed to be fixed in that position, as there was very little motion either upward or inward.

This was not only plainly visible, but the double images demonstrated the fact. Thus I found no double images, when patient was directed to look toward the right and downward; heteronymous images, when looking towards the right, there being also a difference in the height of the images, i. e., the right lower than the left, and the distance of the images increasing laterally in height, when patient looked upward and toward the right.

In looking straight forward, there were also heteronymous double images and difference in height, which increased when looking straight upward. When looking downward, heteronymous images alone with *no difference* in height could be found.

When looking toward the left, patient was unable to see double images, as the rays of light fell upon the peripheral parts of the retina of the right eye. That the retina was susceptible to light, was proven by excluding the left eye, the patient then gave the directions whence the light came correctly.

The upper lid was hanging down and could not be raised. The margin of the orbit was normal. The upper and inner portion of the orbit was occupied by an apparently round semihard tumor, about the size of an ordinary cherry. This tumor was immoveable, broader at the base than at the apex, had a smooth surface and uniform consistency as far as could be detected, the skin moved readily over it. Temperature and appearance of the skin were normal. Pain increased upon pressure.

Anterior portion of the eye and pupillary reaction were normal. No traces of posterior synechiæ. Dioptric media normal. Ophthalmoscopic examination shows a pale optic disc, and margins of disc distinct,(vessels both arteries and veins)anæmic, and a distinct venous pulsation, when patient was asked to look either inward or upward. Patient was put upon anti-syphilitic treatment,receiving two grammes of Potass. iodid. three times a day and mercurial ointment two grammes before bed-time. After twenty inunctions patient began to complain of sore gums. The ointment was discontinued, and iodide of potassium increased gradually up to three grammes three times per day. After patient had been under treatment for one week, pains began to subside rapidly and the tumor in the orbit decreased in size. The eye gradually resumed its proper position in the orbit, and after six weeks the double images had disappeared altogether.

Patient was fed well during time of treatment, regained a healthy appearance, lost pains and was dismissed well, with the advice to continue taking the iodide of potassium.

CORRIGENDA NO. 4.

Page 103, 10th line from below for *straw* read *stone.*
Page 103, 6th line from below for *years* read *days.*
Page 108, 11th line from below for *morbid* read *marked.*